इंटरनेट मानक

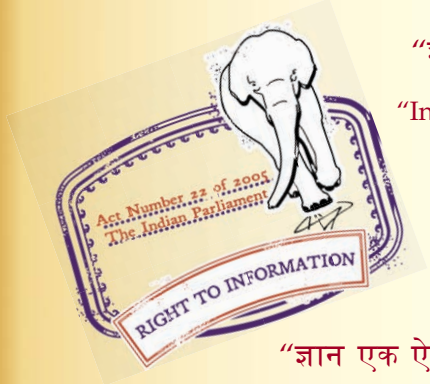
Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 8471 (2003): Acetylene Generators - Requirements(Amalgamation of IS 8471(Part 1 to 5) [MED 16: Gas Cylinders]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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भारतीय मानक

एसीटिलीन जनरेटर — अपेक्षाएँ

(पहला पुनरीक्षण)

Indian Standard

ACETYLENE GENERATORS — REQUIREMENTS

(First Revision)

ICS 23.020.30; 25.160.20

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 2003

Price Group 5

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Gas Cylinders Sectional Committee had been approved by the Mechanical Engineering Divisional Council.

Generation of acetylene gas is regulated under the *Carbide of Calcium Rules*, 1937 of the Government of India, as amended from time to time. This standard has been prepared in consultation and agreement with the statutory authorities under those rules.

Acetylene generators were earlier covered in following five parts and were published in 1977:

Part 1 Low pressure, stationary, of water to carbide, and carbide to water type
Part 2 Low pressure, portable, of water to carbide type
Part 3 Low pressure, portable, of carbide to water type
Part 4 Medium pressure, stationary, of water to carbide, and carbide to water type
Part 5 Medium pressure, portable, of water to carbide, and carbide to water type

Since various items given in these standards were identical in nature, therefore in order to make them more user friendly, these standards have been amalgamated into a single standard.

The composition of the Committee responsible for the preparation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ACETYLENE GENERATORS — REQUIREMENTS

(First Revision)

1 SCOPE

1.1 This standard covers the requirement of design, construction, performance and testing of portable and stationary, automatic and non-automatic, low pressure and medium pressure acetylene generators of water to carbide type or carbide to water type to be employed for generation of acetylene for use in oxy-acetylene welding and cutting systems or cylinder filling and/or any other chemical process.

1.2 For portable generators maximum gas generation capacity shall be limited to 3.2 m^3/h, and shall have a total calcium carbide holding capacity of less than 20 kg.

1.3 Stationary generators are divided into two categories:

a) *Small*: having a maximum production capacity of 5 m^3/h of gas, and

b) *Large*: having production capacity more than 5 m^3/h of acetylene gas.

2 REFERENCES

The following standards listed below contain provisions, which through reference in this text constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
513 : 1994	Cold-rolled low carbon steel sheets and strips (*fourth revision*)
2002 : 1992	Steel plates for pressure vessels for intermediate and high temperature service including boilers (*second revision*)
2825 : 1969	Code for unfired pressure vessels
8452 : 1977	Glossary of terms used in acetylene generators
11006 : 1984	Specification for flash back arrestor (flame arrestor)

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 8452 shall apply.

4 PRESSURE AND TEMPERATURE

4.1 Acetylene generator pressure shall be regulated within limits of the working pressure.

4.2 The temperature of any external part of the apparatus at 130 percent of the rated capacity and at the maximum pressure shall not exceed 80°C. The gas temperature at the outlet of the generator shall not exceed 75°C.

4.3 Generators of the displacement type in which the acetylene is generated by intermittent contact between water and carbide suspended in a basket holder or other contrivance, shall not be considered satisfactory.

4.4 a) *Working Pressure* — The maximum pressure at which the generator is operated throughout its service life.

b) *Design Pressure* — The pressure at which the generator shall be designed. The design pressure shall be 110 percent of the working pressure.

c) *Test Pressure* — The pressure at which the generator will be tested. The test pressure shall be 200 percent of the design pressure.

4.4.1 Maximum working, design and test pressure are given below:

Sl No.	*Type*	*Maximum Working Pressure* kPa (g)	*Design Pressure* kPa (g)	*Temperature* °C	*Test Pressure* kPa (g)
(1)	(2)	(3)	(4)	(5)	(6)
i)	Low pressure generators	14.71	16.18	80	32
ii)	Medium pressure generators	138	152	80	304

5 RATED CAPACITY

5.1 Generators shall be of such design and construction that they shall produce acetylene at the rated capacity during continuous operation having maximum working pressure and/or volume fluctuation of 10 percent.

5.2 The recovery of the acetylene gas shall not be less than 90 percent of the yield rate of the carbide used.

5.3 Measurement of recovery of acetylene gas generated of capacity 5 m^3/h or less shall be carried out for any new generator or new design or modification in the design at manufacturer's works only. Measurement of recovery of acetylene gas for generators having capacity above 5 m^3/h shall be done at a permanent installation approved by the statutory/ competent authority.

5.4 Where the acetylene capacity cannot otherwise be ascertained for a carbide-to-water type generator, the capacity rating shall ordinarily be 62 litres/kg of carbide charged per hour and the maximum rating shall be 125 litres/kg of carbide charged per hour.

6 ASSEMBLY AND CONSTRUCTION

6.1 Generators shall be assembled in a workman like manner to ensure stability, durability and safety.

6.2 Sheet-metal joints of chambers under pressure shall be welded brazed or lock-seamed and sweated with solder. Filler metal employed shall not contain more than 70 percent copper by mass.

6.3 Parts, including piping, attached to the generator shall be brazed in place when necessary.

6.4 Bottoms of generator shells shall not rest directly on the floor or foundation and shall be reinforced, when necessary, to ensure sufficient strength. Bottom support rings, when used, shall be provided with ventilation openings.

6.5 Flash back arrestor (water seal type) shall be so arranged that they may be maintained at the proper level under all conditions of service, irrespective of the use of water for generating purposes, and that the normal level may be determined. Water overflows shall be visible.

6.6 Suitable means shall be provided for draining water seals likely to become thickened by the deposit of residue and for replenishing the water supply.

6.7 Condensation from all parts shall drain to such a point that the accumulation will not interfere with the passage of acetylene or with the operation of the generator, or come in contact with carbide in carbide holder.

6.8 Generators shall be so constructed that the accidental siphoning of water will be impossible.

6.9 Floats shall not be used, except where failure to operate will result only in rendering the generator inoperative.

6.10 Gauge or sight-glasses are not recommended, but where their use is essential for the proper operation of the generator, they may be given consideration for low pressure generators only and when properly protected against the continuous escape of acetylene in the event of breakage and where the acceptability of application has been determined.

6.11 Mechanisms and other generator parts not specifically covered herein shall be of such design and materials as to assure dependable performance, and shall be properly protected against mechanical injury and corrosion.

6.12 Generators shall be provided with good quality water-fill valves, residue drain valves and acetylene shut-off valves conforming to relevant Indian Standards, wherever possible. No additional valves shall be used if, when opened, they allow the escape of acetylene or permit parts to be drained, unless such valves are essential to the proper operation of the generator and cannot be left open inadvertently.

6.13 For portable generators having carbide capacity up to and including 15 kg shall be provided with suitable carrying handles at convenient locations.

7 MATERIAL AND PROTECTIVE COATING

7.1 Metal parts shall be made of steel conforming to IS 513 or IS 2002 or equivalent.

7.2 Copper shall not be used in the construction of acetylene-handling parts. Suitable alloys, including brass, may be used in the construction of exterior parts, such as stuffing boxes, valves, etc. The use of copper alloys in the construction of interior parts shall be avoided unless the copper content of such alloy does not exceed 70 percent.

7.3 Steel sheet and castings shall be painted or coated to retard corrosion.

8 GENERATING CHAMBER

8.1 Water to Carbide Type Generator

8.1.1 The water capacity of the generating chamber of the generator shall be such that on decomposition of the carbide on reaction with water, the sludge formed remains within the carbide holders unless the water and calcium carbide are both introduced in a pre-determined ratio one to the other. In the latter case ratio of water to carbide shall be such as to always

give a fluid sludge while keeping the temperature below that specified in **4.4**. The sludge being more voluminous than the calcium carbide, the charge of carbide should never occupy more than 75 percent of the total available space in the carbide holders.

8.1.2 Each generating chamber shall be connected to gas space or gas holder in such a manner that it will, at all times, give connection either to the gas holder or to the safety pressure relief vent pipe leading to atmosphere.

8.1.3 The design of the generator shall be such that the feeding of water to the gas generator chamber shall be automatically controlled by the gas volume or gas pressure in the gas holder and that under no circumstances the water shall be allowed to overflow into the carbide holders.

8.2 Carbide to Water Type Generator

8.2.1 The water capacity of the generating chamber of carbide to water type generators shall be such that not less than 8 litres of water is provided for each kilogram of carbide which can be introduced into the carbide holder unless the water and calcium carbide are both introduced continuously in a predetermined ratio of one to the other. The carbide capacity for this purpose is taken as the entire space in the holder, which may be occupied by carbide.

8.2.2 Bottoms of generating chambers shall be so designed that the residue will drain readily through the residue valve. Suitable means shall be provided to facilitate the removal of residue. Agitators, when used, shall be substantially mounted and arranged so as not to strike the shell or other parts. Agitator is recommended in case of carbide to water type generator for better efficiency.

8.3 The design and operation of the generator shall be such that when the recharging instructions are followed, the introduction of air into the generating chamber is minimized in so far as practicable.

8.4 Covers of generating chambers shall be securely fastened to hold them in place. The cover shall be sufficiently strong to withstand the stresses of clamping or bolting it in place.

8.5 Hand holes, if any, in generating chambers shall be properly secured unless equipped with suitable interference designed to prevent the feeding of carbide and to vent the generator before removal of the hand hole cover.

8.6 The thickness of steel sheet used in the construction of the generating chamber assembly shall be not less than that specified below, based on the inside diameter of the cylindrical shell. Generator shell having a diameter 5 percent larger than those indicated shall be made of the next heavier sheet specified:

Inside Diameter of the Cylindrical Shell mm (1)	*Sheet Thickness Minimum* mm (2)
450 or less	1.25
475 to 600	1.60
625 to 900	2.00
925 to 1 225	2.50
1 250 to 1 525	3.15
1 550 to 1 825	4.00

8.7 The thickness of steel sheet used in the bottom of generating chamber or for the dished ends shall be not less than the thickness of the shell and preferably of a greater thickness in accordance with IS 2825.

8.8 In all calcium carbide to water generating plants, provision shall be made for the removal of the resulting sludge, so that solid matter cannot collect to such an extent as to reduce dangerously the water capacity of generating chamber. Opening of adequate size shall be provided for inspection or removal of all deposits from the generating chamber.

8.9 In a generating plant in which the generating chamber is automatically filled with water, the level to which it shall be filled may be suitably marked. In a generating plant in which the level of the liquid is automatically maintained during generation, means shall be provided to check that the liquid is at the correct level before the plant is started and is being so maintained whilst the plant is working.

8.10 The generating chamber shall be capable of venting outside of the building before access can be had to the carbide-fill opening unless other means are provided to prevent the dangerous escape of acetylene, to facilitate the removal of residue, the re-filling of the generator with water and the purging of air-acetylene mixtures.

9 CARBIDE HOLDER

9.1 The carbide holder shall be of such design that when filled according to instructions, it will contain at least the rated amount of carbide.

9.2 The total amount of carbide that can be introduced into the holder of a carbide to water type generator, to fill all available space shall be not more than 1 kg/8 litre of water contained in the generating chamber. For water to carbide type generator, to fill all available space, it shall be not more than 1 kg/4 litre of water contained in the generating

chamber, unless the water and calcium carbide are both introduced continuously in a predetermined ratio one to the other.

NOTE — In case of water to carbide generator the residual lime occupies a large volume than the carbide. The holder should be designed to hold all the residue of lime paste on complete reaction. The holder should be so marked that overfilling of carbide is eliminated.

9.3 Fill-opening shall be so located and shall be of such size that it is possible to introduce conveniently the total quantity of carbide for which the holder is designed.

9.4 For water to carbide type generators, the carbide holder shall be so arranged that the charge of carbide may be removed in case of necessity.

9.5 Carbide holders shall be of galvanized steel sheet, or *in-lieu* thereof where uncoated steel is used, the entire outside surface shall be coated with suitable rust-resistant paint.

9.6 Carbide holders or portions of holders not subjected to pressure shall be of not less than 0.8 mm thick steel sheet for capacities up to and including 50 kg and not less than 0.9 mm thickness for capacities over 50 kg.

9.7 Steel sheet used in the construction of carbide holders subjected to pressure shall be of a thickness not less than that specified in **8.6.**

9.8 Carbide holders mounted directly on the generating chamber shall be secured in place rigidly to resist stresses imposed by service condition.

9.9 Where the carbide holder is to be isolated from the generator so as to be charged, the isolation shall be either automatic or it shall not be possible to open the holder until the isolation is complete.

9.10 In those generators where, during the charging period, air has direct access to the gas storage or generating chamber, the carbide charge shall not exceed 135 kg and means shall be provided for displacing the air, or otherwise safely venting any air-acetylene mixtures. The space in the generating plant to which air has access during the charging process shall be as small as is consistent with the proper working of the plant.

9.11 The generator shall be so designed that a carbide holder cannot be opened or removed for charging until the pressure has been released.

10 CARBIDE FEED MECHANISM

10.1 The feed of carbide shall be so controlled that under conditions of normal operation more acetylene cannot be generated than can be carried off by the safety relief without excessive rise of pressure.

10.2 Feed mechanisms shall allow continuous run of the grade of carbide for which the generator has been designed. It is recommended that a run of all commercial sizes of carbide be made impossible. This is to prevent hazards due to use of smaller or larger sizes of carbide for which the generator has not been designed, but which might be used, if the proper size is not available.

10.3 The level from which carbide is fed into the generating chamber shall be more than 250 mm above the normal generating chamber water level.

10.4 A feed mechanism actuated by the rise and fall of a gas bell shall be arranged so that feeding of carbide will start before the bell is not less than 15 cm from its landed position and the carbide feeding mechanism should stop before the gas holder reaches the upper limit of its travel, which might permit the escape of gas from the holder.

10.5 Where a generator (carbide to water type) incorporates a mechanically operated sludge agitator or agitators and if it is found necessary to incorporate this agitator for the safe and efficient working, carbide feed mechanism shall be so designed that the carbide cannot be charged into the chamber unless the agitator is in operation or goes into operation simultaneously with the charging of carbide.

11 AUTOMATIC SAFETY RELIEF VALVE

11.1 To ensure that excessive pressure is relieved, an automatic safety valve or water seal type of safety relief device shall be provided. In case of generators having carbide capacity less than 50 kg, a single relief valve or device may be provided on the hydraulic back-pressure valve. This relief valve or device shall be so mounted that pressure, both from the generating chamber as well as the hydraulic back-pressure valve, shall be relieved automatically. In case of generators having 50 kg or more carbide capacity, two numbers of automatic safety relief, one each on the generating chamber and on the hydraulic back-pressure valve, shall be provided.

11.2 The location of the safety relief shall be such that choking or clogging by carbide residue is avoided and that the acetylene gas has free access to it for escape to the atmosphere.

11.3 When a single relief valve is used, a passage having an area not less than that of a 20 mm diameter circle shall be provided on the generating chamber and hydraulic back-pressure valve, between the acetylene inlet within the generator and the outer of the relief valve.

11.4 Generating chamber relief valves shall be adjusted for start to discharge gas at a pressure

10 percent above the working pressure as stated on the name plate of generator, or at 152 kPa, whichever is lower. These valves shall automatically again closed completely at a pressure which is not more than 15 percent below the pressure at which they commence to open. The valve shall be legibly marked with the maximum set pressure at which the relief device shall open automatically.

11.5 When a water-seal type of relief is provided the relief valve in accordance with **11.4** may not be necessary. The water-seal shall be provided either on the generator or on the hydraulic back-pressure valve so as to prevent rise in pressure in the generator exceeding twice the maximum working pressure or 152 kPa, whichever is lower. When a single water-seal is provided the passage shall have minimum area of a circle having a diameter of 25 mm.

11.6 No shut-off valve shall be used in the piping connecting safety relief with generator.

11.7 The gas outlet including safety valve outlet shall be provided in such a way that their effect cannot be impaired or destroyed by humidity, lime, choking and clogging.

12 FLASH-BACK ARRESTOR

12.1 A device shall be provided to prevent back-pressure of air or oxygen or the propagation of a flash-back in the piping system being transmitted into the generator. This device shall be of hydraulic type or equivalent.

12.2 Steel sheet used in the construction shall be of not less than 2.0 mm thickness. When uncoated steel sheet less than 2.5 mm thickness is used, the interior surface shall be given a heavy coat of suitable rust-resistant paint.

12.3 Removable covers, when used on hydraulic chambers, shall be properly secured.

12.4 Hydraulic back-pressure valve shall be so arranged that excessive amounts of moisture will not be carried away by the out flowing acetylene, which would lower the water level rapidly.

12.5 The design shall be such as to facilitate filling of the hydraulic chamber with water, to the proper level.

12.6 The effective depth of the water-seal in the hydraulic chamber and the volume of water in the chamber shall be adequate to provide an effective seal under all conditions of generator service.

12.7 If the flash-back arrestor is not capable of preventing a reversal of flow, a separate non-return valve shall also be provided.

12.8 The flash-back arrestor shall be designed, manufactured and tested according to IS 11006.

13 SCRUBBERS AND FILTERS

13.1 Scrubbers and filters, when used as an integral part, shall be compatible with the requirements of the generator.

13.2 Such parts shall not have hand holes, which can be opened without first shutting off the acetylene supply, except where an interference arrangement is provided to assure the proper sequence of operation. When the outlet to the service line is connected to the cover plate of filter, or when the cover is properly secured, no interference arrangement is required.

14 SHAFT AND STEM SEALS

14.1 Vented chambers above such parts as diaphragms are not considered acetylene holding chambers necessarily requiring the use of rotating shafts or stems with seals, in which case the openings for shafts or stems shall be close fitting.

14.2 Shaft and stem seals shall be of a proper design to preclude leakage and to provide continued reliable service.

15 GASKETS AND DIAPHRAGMS

15.1 Gaskets and diaphragms shall be of high-grade natural or synthetic rubber compatible with acetylene.

15.2 Diaphragms shall be backed or supported as far as practicable to prevent undue distension.

15.3 Devices using diaphragms, the injury to which might allow escape of acetylene, shall be provided with a suitable housing to prevent gas from escaping. This housing shall be designed for connection of vent piping leading to the outside of the building.

15.4 Where joints are not frequently opened, as between bolted flanges, flat gaskets with flat seats may be used. When only one surface is rounded, it shall be the lower one so that carbide or other material is not likely to lodge thereon and interfere with proper closure.

16 PIPING

16.1 Seamless steel piping and steel or malleable iron fittings shall be used.

16.2 Pipe connections to sheet metal parts shall be made so as to secure a substantial and leak-tight joint. They may be welded or brazed. They may be made with threaded flanges welded, brazed or riveted in place. They may be made with lock nuts on both sides of the sheet. Flanges, if riveted, shall be secured by not less than three rivets. Flanges and lock nuts shall fit closely to the contour of the sheet. Riveted joints and those employing lock nuts shall be thoroughly sweated with solder.

16.3 Pipe connections required to be opened may be made with right and left couplings, or with long-thread nipples with lock nuts, or with unions. Connection of large piping to generators or to auxiliary parts may be made by suitable bolted flange-type unions utilizing good gasket material.

16.4 Piping shall drain to the generating chamber, wherever practicable.

16.5 The size of the pipes carrying the gas shall be proportioned to the maximum rate of generation so that undue back-pressure may not occur.

16.6 For medium and heavy quality tubes for a piping up to and including 25 mm nominal bore, medium quality fitting shall be used, and for over 25 mm bore, heavy quality bends shall be used in preference to elbows. All fittings shall have wall thickness not less than the pipe to which it is connected.

17 PRESSURE REGULATOR

The generator may incorporate regulator by which the operator can control the outlet pressure of acetylene within the permissible range.

18 GAS HOLDER

18.1 Gas holders shall be constructed of suitable steel and interior and exterior surfaces shall be given with a suitable rust resistant paint.

18.2 Steel sheet used in the construction of gas holder tanks shall be of a thickness not less than that specified in **8.7** but in no case less than 0.80 mm. Movable gas bells may be slightly lighter than the requirement for the outer shell or tank.

18.3 The bell portion of a gas holder constructed on the gas meter principle shall be provided with substantial means for guiding its movement, and shall carry a stop to check the bell about 25 mm above the normal blow-off point.

18.4 When constructed on the gas meter principle, the gas holder shall be so arranged that when the gas bell is filled to its maximum with acetylene at normal pressure, its lip or lower edge will extend at least 225 mm below the inner water level.

18.5 When constructed on the gas meter principle, the dimensions of the tank portion of the gas holder shall be so related to those of the bell and other parts that either a pressure at least twice as great as safety relief pressure will be necessary before gas can be forced from the holder, or that at the maximum safety relief pressure the lip or lower edge of the gas bell will extend at least 75 mm below the inner water level.

18.6 The bell shall move freely and shall have a clearance of at least 50 mm around the outside. This clearance is to prevent binding due to distortion of the bell or the outer shell. Guides attached to the gas bell, if used, shall be set at the factory, and shall be arranged so as not to injure the protective coating of the shell.

18.7 When constructed to generator, the acetylene capacity of the gas holder shall be not less than one-third of the hourly rating of the generator.

18.8 A positive arrangement shall be provided to prevent a back flow of acetylene from the gas holder to the generator, when these are separate vessels.

18.9 The gas bell shall be protected where feed rods or moving parts strike it, and additionally reinforced or braced at the bottom when necessary. When weights are added, they shall be so arranged as to secure stability.

18.9.1 To ensure that the gas pressure inside the gas meter type (floating bell) gas-holder does not vary with the discharge of gas from the holder. In the event when mass of the bell is not known the following formula shall be used:

$$p = \frac{W}{A \times 10^4}$$

where

p = gas pressure in kgf/cm^2,

W = mass of bell in kg, and

A = the cross-sectional area of the bell in m^2 $\frac{\pi}{4} \times D^2$ where D is diameter in m.

18.10 Gas holders are recommended to be used for low-pressure generators only.

19 OPERATION AND PERFORMANCE

19.1 Generators, whether automatically or otherwise regulated, shall be uniform in performance producing acetylene as and when required.

19.2 If the operating pressure is regulated by the carbide feed mechanism, pressure fluctuations shall not be more than 10 percent when the generator is operated at rates up to and including its rated acetylene producing capacity. Infrequent and momentary fluctuations may be disregarded. The flow of gas will also vary corresponding to the variation of pressure within the permissible limit of 10 percent of the rated pressure.

19.3 Abnormal pressure, overheating, or other conditions considered unsafe, shall not occur at any stage of the process when using carbide of the proper grade and when operating under any load up to and including 130 percent of the rated capacity of the generator.

19.4 All vents and pipes for stationary generator at its permanent installation shall end outside the premises at a place where the outflow of acetylene cannot create a risk of fire or explosion. The ends of the pipe have to be protected from damage, atmospheric influence and from birds and insects.

19.5 Lime sludge discharged shall not be capable of generating more gas and shall not contain any tarry or other heavy condensation products from the decomposition of the carbide.

19.6 Operation of generator at 130 percent of rated capacity shall not result in venting of the generating chamber safety relief valve when the use of acetylene is stopped.

19.7 This performance and operation test should be conducted on each of the large generators at the permanent installations whereas for portable and small generators should be tested at the acetylene generator manufacturer's premises on minimum one number of the individual type and size per year.

20 TESTS BY MANUFACTURER

20.1 Each generator shell, assembly and auxiliary parts, except those having seals open to the atmosphere, shall be tested pneumatically, applied for a period of not less than 30 min and shall be free from leakage at a pressure specified in **4.4.1**. Chambers and other assemblies having open seals shall be tested to determine that they are free from leakage. Manufacturers' shall carry out hydraulic test for each component or part at the test pressure specified before conducting pneumatic test for the assembled generator.

20.2 Each generator of carbide-to-water type shall be subjected to tests to determine that the carbide feed mechanism is in proper working condition.

21 INSTRUCTIONS

Charging, operating and maintenance instructions shall be furnished with each generator.

22 MARKING

22.1 Each generator shall be provided with a permanently attached name plate showing the following:

a) Acetylene-production rating in standard cubic meter per hour (m^3/h);
b) Amount and size of carbide for a single charge;
c) Manufacturer's name and designated marking;
d) Words 'Stationary' or 'Portable', 'Continuous' or 'Non-continuous', 'Low' or 'Medium Pressure', and 'Carbide-to-water' or 'Water-to-carbide';
e) Acetylene generator;
f) Method of carbide feed – 'Automatic' or 'Manual'; and
g) Maximum working pressure kPa (g).

22.2 If a manufacturer produces or assembles acetylene generators at more than one factory, each generator shall have a distinctive marking, which may be in code, by which it may be identified as the product of a particular factory.

23 BIS CERTIFICATION MARKING

23.1 The acetylene generators may also be marked with the Standard Mark.

23.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act,* 1986 and the rules and regulations made thereunder. The details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Composition of Gas Cylinders Sectional Committee, ME 16

Organization	*Representative(s)*
Department of Explosives, Nagpur	SHRI R. H. BHALEKAR (***Chairman***) SHRI SHAMBHU PRASAD (*Alternate*)
All India Industrial Gases Manufacturers, Association, New Delhi	SHRI A. R. SINGH SHRI S. DEB (*Alternate*)
Balmer Lawrie & Co Ltd, Mathura	SHRI K. GOPINATHAN SHRI DEBASHIS DASS (*Alternate*)
Bharat Petroleum Corporation Ltd, Mumbai	SHRI GEORGE PAUL SHRI S. K. DEY (*Alternate* I) SHRI SURESH NAIR (*Alternate* II)
Bharat Pumps & Compressors Ltd, Allahabad	SHRI UTTAM KUMAR SHRI S. K. TEWARI (*Alternate*)
BOC India Ltd, Kolkata	SHRI P. K. BHATTACHARYA SHRI N. R. PAL (*Alternate*)
Everest Kanto Cylinder Ltd, Aurangabad	SHRI AJIT K. PARIKH SHRI P. M. SAMVATSAR (*Alternate* I) SHRI A. G. KHAMKAR (*Alternate* II)
Hindustan Petroleum Corporation Ltd, Mumbai	SHRI K. KRISHNAN SHRI D. N. KRISHNAMURTHY (*Alternate*)
Hindustan Wires Ltd, Faridabad	SHRI R. TANDON SHRI N. K. SAWHNEY (*Alternate*)
Indian Gas Cylinders, Faridabad	SHRI E. M. PATEL SHRI D. C. JAIN (*Alternate*)
Indian Oil Corporation Ltd, Mumbai	SHRI B. L. BANSAL SHRI A. N. KHAPRE (*Alternate*)
International Industrial Gases Ltd, Kolkata	SHRI D. K. GARG SHRI N. K. GARG (*Alternate*)
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This Indian Standard has been developed from Doc : No. ME 16 (0570).

Amendments Issued Since Publication

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Printed at Prabhat Offset Press, New Delhi-2